CAPITAL STRUCTURE AND FIRM VALUE EVIDENCE FROM QUOTED AGRICULTURAL COMPANIES IN NIGERIA

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ABSTRACT

This study investigated the influence of capital structure on firm value, with specific focus on long-term debt, short-term debt, and interest coverage options available to the firm manager. Adopting ex-post facto research design, a sample of four agricultural firms listed on the Nigerian Exchange Group (NGX), selected based on their continuous listing (2014 to 2023) and availability of annual financial reports where data were sourced was examined. Descriptive and inferential statistical methods were used, with preliminary tests: normality of data and multicollinearity test to compliment the regression analysis. Least Square Dummy Variable regression analysis technique which was employed to test the stated hypotheses, reveals that excessive usage of long-term and short-term debt options negatively affect financial firm value, suggesting that over-reliance on debt financing can hinder market performance. In contrast, interest coverage usage option exhibits a positive effect on firm value, highlighting the importance of efficient debt management practices. The findings emphasize the need for agricultural firms to maintain strong interest coverage ratios while minimizing short-term and long-term debt reliance to reduce liquidity risks. Based on the outcomes, this study recommends that managers of agricultural firms should adopt strategic financial management approaches, including improved cash flow forecasting and access to long-term, low-cost capital, to foster sustainable growth.

Keywords: Capital Structure, Tobin Q, Interest Coverage, Least Square Dummy Variable Regression, Listed Agricultural Firms in Nigeria

1.0 INTRODUCTION

It is common knowledge that the value of a firm can be maximized by minimizing its capital cost. Therefore, one critical goal in strategic management is to identify the optimal capital structure (Farooq et al., 2024; Cerkovskis, et al., 2022) which exists when debt and equity can be combined to reduce the cost of capital and enhance the firms' value (Iwedi, et al., 2023). As noted by Weinzimmer, (1997), the growth of any company directly depends on strong financial backgrounds hence, capital structure plays a major role in the financial management of a company (Al-Janadi, 2021). When evaluating a firms' value and investment potential, investors often consider a company's capital structure. A well- balanced capital structure can signal financial stability, efficient use of capital, and the ability to generate consistent cash flow (Mansour et al. 2022). In the view of Etale and Uzakah, (2019) capital structure refers to the way a company finances its operations through a combination of equity (shares) and debt (loans, bonds, etc.) and the decision involves determining the proportion of debt and equity that will be employed to fund its activities. By choosing an optimal mix of debt and equity, a company can minimize its overall cost of capital and maximize shareholder value (Kurniasih & Rustam, 2022). The importance of capital structure lies in its impact on a company's financial health and value (Cerpentier et al. 2022). In the opinion of Vo, (2021) capital structure affects the company's overall cost of capital, which is the weighted average cost of debt and equity. Debt generally has a lower cost than equity, as interest on debt is tax-deductible. Debt financing introduces financial leverage, which can magnify returns for shareholders when the company performs well. However, it also increases the risk because interest payments and principal repayment obligations must be met regardless of the company's performance (Zhou et al. 2021). The capital structure of a company has a significant impact on its long-term financial management and value and it also influences the risk and return profile of a company. Particularly, Judge and Korzhenitskaya, (2022) posit that capital structure decisions of a company can affect its credit rating, stock price, and access to capital markets and this indicate that capital structure is essential for a company's long-term success and sustainability (Aksoy et al. 2020).

However, in spite of the numerous empirical contributions of related studies conducted within the Nigerian space to include but not limited to those of Kayode, and Adewoye, (2020), Ajala, and Adesanya, (2022), Lawson and Osaremwinda, (2019), Udo, Jack, Okoh, Agbadua, Eke, and Onyemere, (2024), Edoka, and Ijeoma, (2024), no study is seen to discuss the variable of interest coverage as a capital structure complementary (indirect measure) in studies examining capital structure and firm performance nexus. Interest coverage ratio primarily reflects a firm's ability to service debt, which is influenced by its capital structure especially the level of debt financing (Fosu, 2013) thus providing key insights into how well a firm manages its debt obligations: a core component of capital structure management (Zeitun, & Tian, 2007). Booth, Aivazian, Demirguc-Kunt, and Maksimovic, (2001), document that low interest coverage ratio suggests higher financial risk, often resulting from excessive debt, thus linking it to capital structure decisions and providing a valid motivation for this study.

Further, in spite of numerous related studies conducted home and abroad, only a handful have been conducted within the Nigerian space with particular focus on agricultural firms listed on the floor of the Nigerian Exchange Group. Undoubtedly, the agricultural sector plays a pivotal role in Nigeria's economy and holds substantial economic significance (Okunlola, & Ayetigbo, 2024; Sertoglu, et al., 2017; Tonuchi, & Onyebuchi, 2019). Presently, agriculture contributes about 24% of the nation's Gross Domestic Product (GDP), (Nwankwo, et al., 2024), making it one of the most important industries in Nigeria. The sector has been the backbone of the economy, with crops such as cocoa, cassava, palm oil, and rubber being key exports. In 2023, the value of Nigeria's agricultural market stood at approximately 35 billion dollars and is projected to grow steadily, reaching an estimated 50billion dollars by 2025 (Wambua & Okeke, 2023).

However, over the past few years, the agricultural industry in Nigeria has faced numerous challenges, including the rising cost of commodities, macroeconomic instability, and inflationary pressures (Abaidoo & Agyapong, 2024; Raphael, et al., 2024). The significant hike in food prices, largely driven by supply chain disruptions, currency devaluation, and insecurity, has severely impacted both consumers and producers (Akhanolu & Ogunnubi, 2024; Adekunle, Papa, et al., 2024), even though Nigeria remains one of the top agricultural producers in sub-Saharan Africa, with its exports of cocoa alone valued at 800 million dollars annually, contributing substantially to the country's foreign exchange earnings (Idris, 2020). Notably, the persistent macroeconomic instability, inflationary pressures, and commodity price volatility in Nigeria have exerted downward pressure on the value of listed agricultural firms by eroding profit margins, increasing operational costs, and deterring long-term investment (Abaidoo & Agyapong, 2024; Akhanolu & Ogunnubi, 2024). Supply chain disruptions and heightened insecurity have further exacerbated production inefficiencies and reduce output, while currency devaluation inflates the cost of imported inputs, thus straining working capital and shrinking shareholder value (Raphael et al., 2024). In such circumstances, it is important to highlight the opinion of Adekunle, Papa et al. (2024) who noted that investor confidence wanes under such economic uncertainties, diminishing market valuation of firms.

However, optimal capital structure choices particularly those that balance debt and equity efficiently can mitigate such adverse effects by lowering the cost of capital, enhance liquidity, and support strategic investments in resilience-enhancing infrastructure. Modigliani and Miller (1958, revised with taxes) and Abor (2005) affirm that a well-structured capital mix can improve firm value by maximizing returns while managing financial risk. As listed agricultural firms navigate uncertainties of inflation, exchange rate fluctuations, and rising input costs, understanding the role of capital structure in optimizing firm value is critical (Gaydarzhyy'Ska, et al., 2024). Thus, for Nigerian listed agricultural firms, adopting a proactive capital structure strategy will serve as a financial shield against macroeconomic shocks, stabilizing firm value in turbulent times. Therefore, given the current economic climate and the volatile nature of global commodity markets, there is a pressing need for a study of this nature. The sector's ability to grow and remain profitable amidst these challenges hinges on the efficient management of financial resources, including the balance between debt and equity financing such that more than ever, there is an urgent call for studies that examines how capital structure decisions affect firm value in this vital sector of the Nigerian economy.This study aims to examine the influence of capital structure on firm value, on long-term debt, short-term debt, and interest coverage options available to the firm manager. The specific objectives include to examine the effect of long-term debt on the firm value of quoted agricultural companies in Nigeria, to evaluate the impact of short-term debt on the firm value of quoted agricultural companies in Nigeria and to assess the influence of interest coverage ratio on the firm value of quoted agricultural companies in Nigeria. In doing so, the study tests the hypothesis that long term debt significantly influences firm value of listed agricultural firms in

Nigeria and Short term debt significantly influences firm value of listed agricultural firms in Nigeria.

The remainder of this paper is organized as follows. Section 2 present the conceptual and theoretical review, highlighting relevant models and previous studies. Section 3 outlines the methodology employed in the study, including data collection and analysis techniques. Section 4 provides a detailed presentation of the findings and results. Finally, Section 5 present the discussion and conclusion.

2.0 LITERATURE REVIEW

2.1 Capital Structure

Capital structure is a fundamental concept in corporate finance that describes the specific mixture of debt and equity a firm utilizes to finance its operations and long-term investments. The concept has attracted extensive scholarly attention due to its critical role in determining firm sustainability, risk exposure, and financial flexibility. According to Al-Najjar and Kilincarslan (2016), capital structure embodies the strategic balance between internal and external sources of finance, including retained earnings, long-term debt, and equity capital, aimed at achieving an optimal cost of capital. Ozkan and Ozkan (2017) further posit that capital structure decisions reflect managerial preferences and firm-specific characteristics that align with value maximization objectives. Capital structure is not only a function of financing choices but also a reflection of corporate governance, market dynamics, and institutional frameworks (Khemakhem & Hachana, 2020). Building on this view, Nadarajah, Ali, Liu, and Huang (2016) conceptualize capital structure as a dynamic financial tool that must adapt to changes in macroeconomic and firm-level factors. Its components typically include long-term debt, which comprises bonds, debentures, and other long-duration financial obligations used for capital-intensive projects; and short-term debt, such as commercial papers, bank overdrafts, and trade credits, which are geared toward meeting immediate liquidity needs (Vo & Ellis, 2017). These components are often assessed through direct measures like long-term debt to total assets ratio and the short-term debt to total assets ratio, respectively, or indirect measures like interest coverage ratio all serving as indicators of firm's leverage and financial risk exposure (Rashid, 2018). A well-structured capital mix offers firms the strategic advantage of cost efficiency, risk diversification, and enhanced financial stability, underscoring its conceptual importance in strategic financial management. Saeed and Sameer (2017) argue that capital structure decision is not a one-size-fits-all approach but a multidimensional construct. Overall, capital structure serves as a conceptual bridge between financing strategy and organizational resilience, making it a critical focal point in contemporary corporate finance literature.

Firm Value

Firm value is a multifaceted concept in corporate finance that encapsulates the overall worth of a company as perceived by various stakeholders, particularly investors, in relation to its capacity to generate sustainable future cash flows, maximize shareholder wealth, and ensure long-term profitability. Conceptually, it transcends mere book value or accounting-based assessments, focusing instead on the intrinsic and market-based valuation of a firm’s assets, operational efficiency, and growth prospects (Ibhagui, 2020; Akani & Emeni, 2017). Scholars have offered varied definitional perspectives on firm value. According to Owolabi and Obida (2019), firm value represents the investors’ perception of a firm’s ability to generate wealth, reflected in its stock price performance and market capitalization. Similarly, Nduka and Anyanwu (2021) define firm value as the economic measure that captures the efficiency with which corporate resources are utilized to increase owners’ equity and attract external capital. From a strategic management viewpoint, Egbunike and Odum (2018) posit that firm value reflects the market’s evaluation of a firm's past, current, and anticipated performance, thus serving as a barometer for managerial effectiveness, governance strength, and competitive advantage. However, a common and robust proxy employed in measuring firm value is the Tobin Q ratio, which is defined as the ratio of the market value of a firm’s assets (usually approximated by the market value of equity plus liabilities) to the replacement cost of assets (Asuquo & Nweze, 2017; Uwuigbe et al., 2019). A Tobin Q greater than one indicates that a firm's market value exceeds its asset replacement cost, suggesting favorable investor sentiment and efficient asset utilization. In contrast, a value below one may suggest undervaluation or suboptimal asset deployment. Tobin Q is particularly favored in literature for its ability to capture both tangible and intangible elements of firm performance and strategic positioning, offering a dynamic reflection of firm value beyond conventional accounting metrics (Okereke et al., 2022; Ogbonna & Ezeabasili, 2021).

Capital Structure and Firm Value

The nexus between capital structure and firm value has generated substantial theoretical debate, yielding divergent interpretations in the literature. The traditional view, as articulated by Modigliani and Miller (1958), initially posited that in a world without taxes, bankruptcy costs, or asymmetric information, capital structure is irrelevant to firm value. However, their later revision (Modigliani & Miller, 1963) acknowledged the tax shield benefits of debt, suggesting that a higher debt ratio could enhance firm value due to interest tax deductibility. This view aligns with the Trade-Off Theory, which argues that firms optimize their capital structure by balancing the tax benefits of debt against bankruptcy and agency costs (Kraus & Litzenberger, 1973). In contrast, the Pecking Order Theory (Myers & Majluf, 1984) asserts that firms prioritize internal financing over external debt or equity to mitigate information asymmetry, implying that capital structure choice is driven more by financing needs than firm value maximization. Further, Agency Theory (Jensen & Meckling, 1976) introduces the conflict between shareholders and debt holders, suggesting that excessive debt may lead to underinvestment and value erosion due to managerial risk aversion or asset substitution. Empirical studies have consequently reported mixed findings, with some supporting a positive relationship between capital structure and firm value when debt is optimally utilized (Abor, 2005), and others documenting a negative impact when debt levels become excessive and risk financial distress (Zeitun & Tian, 2007). These theoretical tensions are reflected in the diverse proxies used to measure capital structure, including debt-to-equity ratio, debt-to-assets ratio, and indirectly, interest coverage ratio, which captures a firm's capacity to meet interest obligations and hence indirectly reflects its leverage sustainability.

2.2 Long Term Debt and Firm Value

The link between long-term debt and firm value has generated diverse theoretical interpretations in financial literature, leading to both positive and negative assertions. Proponents of the positives draw primarily from the trade-off theory, which posits that firms seek an optimal capital structure by balancing the tax benefits of debt with the cost of financial distress (Kraus & Litzenberger, 1973). Long-term debt, in this view, signals financial discipline and allows firms to exploit interest tax shields, thereby enhancing firm value. Abor (2005) and Fosu (2013) affirms that, in some contexts, firms with higher long-term debt levels demonstrate improved firm performance, largely due to efficient capital allocation and fiscal benefits. Conversely, the pecking order theory advanced by Myers and Majluf (1984) suggests that firms prefer internal financing and only resort to debt when necessary, implying that a high long-term debt to asset ratio may signal financial constraint or over-reliance on external funding, thus negatively impacting firm value. Supporting this stance, Rajan and Zingales (1995) observed that excessive long-term leverage could diminish firm value, particularly in environments with weak investor protection and high agency costs. Additionally, agency theory (Jensen & Meckling, 1976) argues that high levels of debt can exacerbate agency conflicts between debt-holders and equity-holders, leading to suboptimal investment decisions and ultimately reducing firm value. Supporting this position, Apergis, and Sorros, (2011), Akhtar, Khan, Shahid and Ahmad, (2016), document a significant negative relationship between long term debt and firm value. Hence, based on the foregoing argument, the first hypothesis is stated as follows: *Long Term Debt Significantly Influences Firm Value of Listed Agricultural Firms in Nigeria*

Short Term Debt and Firm Value

The link between short-term debt and firm value has been a subject of contentious theoretical debate, with divergent schools of thought offering varying interpretations rooted in different corporate finance theories. On the one hand, proponents of a positive association argue that short-term debt, being less costly and easier to access, enhances firm value by minimizing the weighted average cost of capital and allowing firms to exploit short-term investment opportunities more efficiently. This perspective is supported by the trade-off theory, which posits that an optimal mix of debt and equity can maximize firm value by balancing tax advantages of debt with the costs of financial distress (Myers, 1984). In this context, short-term debt is seen as a flexible financing tool that reduces agency costs by imposing discipline on managers due to its frequent refinancing requirements (Jensen & Meckling, 1976). In this context, Abor (2005) found a positive relationship between short-term debt to asset ratio and firm value among Ghanaian firms, suggesting that managers effectively utilize short-term obligations to finance productive activities. Conversely, other scholars caution against excessive reliance on short-term debt, citing the pecking order theory, which holds that firms prefer internal financing and only resort to debt especially short-term, when necessary, due to its higher rollover risk and vulnerability to interest rate fluctuations (Myers & Majluf, 1984). This view suggests a negative relationship, as high short-term debt increases the risk of liquidity crises and financial distress, ultimately eroding firm value.

Supporting this view, Rajan and Zingales (1995), Toby and Sarakiri, (2021) reported that firms with higher short-term leverage are more exposed to refinancing and default risk, particularly in volatile or underdeveloped financial environments, leading to value diminution. Based on the foregoing argument, the second hypothesis is stated as follows: *Short Term Debt Significantly Influences Firm Value of Listed Agricultural Firms in Nigeria*

Interest Coverage and Firm Value

The relationship between interest coverage ratio and firm value has elicited divergent theoretical interpretations within the finance literature, largely due to the complex interplay between debt utilization, financial flexibility, and firm risk exposure. From the perspective of trade-off theory, a positive view is often posited, as a higher interest coverage ratio signals strong earnings relative to interest obligations, indicating effective debt management and lower default risk, which can enhance investor confidence and, by extension, firm value. This position is supported by Modigliani and Miller's (1963) revised capital structure theory, which incorporates the tax shield benefits of debt suggesting that as long as a firm maintains a comfortable interest coverage ratio, it can enjoy the advantages of debt without incurring excessive financial distress costs. Fosu (2013) from the South African context aligns with this view, as firms with higher interest coverage ratio exhibited superior performance metrics, implying value appreciation. On the contrary, proponents of pecking order theory and agency cost theory argue that an inverse link may exist in certain conditions. From this viewpoint, an excessively high interest coverage ratio could indicate underutilization of debt and a conservative capital structure, which may result in inefficient capital allocation and opportunity costs that negatively affect firm value. Jensen (1986), through the lens of free cash flow theory, emphasizes that firms with surplus earnings and low leverage may experience managerial inefficiencies and agency costs, thus reducing value. Buttressing this view, Oli, (2021) and Afolabi, Olabisi, Kajola, and Asaolu, (2019), documented negative associations between interest coverage ratio and firm value. Based on the foregoing arguments, the third hypothesis is stated as follows: *Interest Coverage Significantly Influences Firm Performance of Listed Agricultural Firms in Nigeria*.

2.3 Theoretical Review

Agency Theory of Debt

Jensen's (1986) Agency Theory of Debt centers on the idea that debt can act as a mechanism to reduce agency costs between managers and shareholders by disciplining management's use of free cash flow. According to this theory, when firms take on debt, they are obligated to make interest payments, which reduce the amount of free cash flow available for discretionary spending by managers. This constrains managerial behavior and prevents them from investing in projects that may not maximize shareholder value (Lambrecht & Myers, 2008). The theory suggests that managers, when left with excess cash, may be tempted to invest in low-return projects or engage in empire-building, which may not align with shareholder interests (Ross, Westerfield & Jordan, 2018). Therefore, the use of debt serves as a tool to align the interests of managers with those of shareholders by reducing the excess cash available for non-value-adding investments. However, Evanoff & Wall, (2000) point out that the benefits of debt as a disciplining tool can be offset if the firm incurs excessive leverage, leading to financial distress. This underscores the delicate balance firms must strike between using debt to limit agency costs and avoiding the risks associated with high levels of debt. The theory provides insights into how leveraging debt impacts managerial decision-making, emphasizing the role of debt in curbing opportunistic behavior while maintaining financial sustainability.

Trade Off Theory of Capital Structure

The Trade-Off Theory, as articulated by Kraus and Litzenberger (1973), posits that firms determine their optimal capital structure by balancing the tax advantages of debt with the potential costs of financial distress. According to this theory, debt financing provides a tax shield since interest payments are tax-deductible, thereby increasing firm value through reduced tax liabilities. However, as firms increase their leverage, they also increase the risk of financial distress, which can erode firm value due to bankruptcy costs, agency costs of debt, and loss of operational flexibility (Frank & Goyal, 2009). However, the theory asserts that there exists a point of equilibrium where the marginal benefit of tax shield equals the marginal cost of financial distress, and this point represents the optimal capital structure that maximizes firm value. Firms that maintain capital structures close to this optimal point are likely to experience enhanced performance and valuation (Myers, 1984). However, exceeding this optimal debt level can lead to increased default risk and decreased investor confidence, ultimately reducing firm value (Graham & Harvey, 2001). Thus, the Trade-Off Theory provides a lucid framework for understanding the capital structure–firm value nexus, with strong emphasis that while debt can enhance value through tax savings, excessive reliance on debt can diminish value through heightened distress costs.

3.0 METHODOLOGY

This study adopts *ex-post facto* research design to examine the effect of capital structure on firm value of listed agricultural firms in Nigeria. As of December 31, 2023, the population of listed agricultural firms was five (5) (Nigerian Exchange Group (NGX, Website, 2023). Purposive non-probability sampling technique was employed to select four (4) firms based on specific criteria: (1) sampled firms must have been listed before 2014, and must be actively traded on the Nigerian Exchange Group as of the time of this study; (2) sampled firms must provide full access to its annual financial reports and all required information for the study must have been provided. The need to sample only agricultural firms listed before year 2014 is to account for homogeneity of periodic scope, which allows the biases of newly listed firms (relative to others) to be sieved. Data for this study were obtained from secondary sources, specifically stock exchange fact books and sampled firms' annual financial reports. The analysis of the data includes both descriptive and inferential statistics, utilizing pre-regression analysis: test for data normality and test for multicollinearity, followed by panel regression analysis using fixed and random effect models determined by the Hausman specification test. Panel data analysis encompasses statistical methodologies that integrate data collected across multiple time points for the same subjects, thereby capturing both cross-sectional and time-series aspects (Arellano & Bonhomme 2011). This approach enables researchers to address individual heterogeneity, allowing for more precise and reliable estimates by accounting for unobserved factors that could potentially impact the outcomes (Liu, 2015). In contrast to ordinary least squares (OLS) methods, which typically analyze cross-sectional and time-series data separately, panel data models offer the advantage of controlling for time-invariant characteristics. This capability leads to more efficient and unbiased estimations, particularly in the context of exploring complex dynamic relationships.

3.1 Firm Value Functional Model

TOBIN Q *ƒ*(Long-Term Debt Ratio + Short Term Debt Ratio + Interest Coverage ratio). However, the econometric form of the model which was modified from prior related study of Njagi, (2013) to suit the objective of this study is expressed as follows.

3.2 Firm Value Econometric Model

$QRATIO_{it} = \partial_0 + \partial_1 LTDEBT_{it} + \partial_2 STDEBT_{it} + \partial_3 INTCOV_{it} + \mu_i$

Where:

QRATIO = Tobin Q Ratio

LTDEBT = Long Term Debt

STDEBT = Short Term Debt

INTCOV = Interest Coverage

∂_0 = Constant

∂_1- ∂_3 = Slope Coefficient

μ = Stochastic disturbance, i = i^{th} company, t = period

Table 1 **Operationalization of Variables**

S/N	Variables	Measurements	Sources	Apriori Sign
Dependent Variable				
1	Tobin Q	Computed as debt book value + stock market value divided by total assets	Jafari, (2016)	
Independent Variables				

1	Long Term Debt Ratio	Computed in percentage as non-current liabilities divided by total asset	Mwangi, Makau, & Kosimbei, (2014).	**-**
2	Short Term Debt Ratio	Computed in percentage as current liabilities divided by total asset	Mboi, Muturi, & Wanjare (2018).	**-**
3	Interest Coverage	Computed by dividing the cash generated from operations by interest payments	Ji, (2019).	+

***Source*:** Author's Compilation (2025)

4.0 RESULTS AND DISCUSSION OF FINDINGS

4.1 Descriptive Statistics

Table 2 presents the descriptive statistics results for both independent and dependent variables of interest, providing a comprehensive overview of the arithmetic mean, standard deviation, minimum, and maximum values over the review period. In relation to Tobin Q ratio (QRATIO), the table reveals a mean value of 1.103, with a standard deviation value of 1.879, indicating a moderate liquidity position among listed agricultural firms in Nigeria during the ten-year period under review. This aligns with prior studies of Ibrahim, (2017), who found a mean QRATIO of 1.2 for Nigerian firms, suggesting similar liquidity trends.

Table 4.1 Descriptive Statistics Result

Variable	Obs	Mean	Std. dev.	Min	Max
QRATIO	40	1.10325	1.878623	.09	12.06
LTDEBT	40	24.20525	24.34072	0	92.87
STDEBT	40	32.90225	22.41126	6.46	76.5
INTCOV	35	14.35533	46.61815	.7640074	243.1708

Source; Authors' Computation (2025)

Further, long-term debt (LTDEBT) variable shows a mean value of 24.205, with a standard deviation value of 24.341, indicating significant leverage, which mirrors the findings of Edesiri, (2014) who reported comparable figures in Nigerian agricultural firms. For short-term debt (STDEBT), the mean value is 32.902, with a standard deviation value of 22.411, consistent with the outcome of Omodara, (2023), who observed similar levels of short-term debt reliance. Finally, interest coverage ratio (INTCOV) variable exhibits a mean value of 14.355, with a substantial standard deviation of 46.618, reflecting high variability in the sampled firms' ability to cover interest obligations. This result is consistent with earlier findings of Enekwe, Agu, and Eziedo, (2014), who reported variability in interest coverage ratios among Nigerian firms.

Normality of Data Statistics

Table 3 presents the results obtained from the Shapiro-Wilk normality test conducted on the data utilized in this study. The findings indicate that the variables of interest exhibit significant deviations from normality. Specifically, Tobin's Q ratio (QRATIO, z = 6.609; Prob>z = 0.00000) is not normally distributed, as evidenced by its statistically significant probability value. Similarly, long-term debt ratio (LTDEBT; z = 4.187; Prob>z = 0.00001), short-term debt ratio (STDEBT; z = 3.226; Prob>z = 0.00063), and interest coverage ratio (INTCOV; z = 6.705; Prob>z = 0.00000) are also not normally distributed based on their z-statistics and associated probabilities. These findings align with prior studies Malchev, Atanasovskia, and Trpeskaa, (2024) who also reported deviations from normality in financial ratios across various industries.

Table 4.2 Normality of Data Analysis Result

Variable	Obs	W	V	z	Prob>z
QRATIO	40	0.41513	23.119	6.609	0.00000
LTDEBT	40	0.81503	7.311	4.187	0.00001
STDEBT	40	0.88282	4.632	3.226	0.00063
INTCOV	35	0.30422	24.834	6.705	0.00000

Source; Authors' Computation (2025)

Although the dataset displays non-normality, the researcher proceeded with parametric tests, consistent with the approach taken in prior study of Erceg-Hurn, and Mirosevich, (2008) who argued that parametric tests are generally robust and can still yield reliable outcomes, especially when the non-normality in data is caused by factors such as outliers or mild skewness, rather than a fundamentally different distribution. This practice is further supported by Templeton & Blank, (2023), who maintained that parametric methods often remain valid when the violation of normality assumptions is not extreme.

Regression Analysis

The mean value of the variance inflation factor (VIF) obtained from the pooled ordinary least square model presented in table 4, is 1.22 which is well below the benchmark value of 10, confirming the absence of multicollinearity. Both F-statistic (3.36, p-value = 0.0000) for fixed effect model and Wald-statistic (23.35, p-value = 0.0000) for random effect model are statistically significant at 1%. The R-squared values for fixed and random effect models; 0.0370 and 0.0278, indicate that about 4% and 3% of the systematic variations in firm performance is been explained by the independent variables. The p-value 0.0208 of the Hausman specification test supports the use of fixed effect model. However, a test for fixed effect error (test for groupwise heteroskedasticity) reveals unobserved heterogeneity, indicating a violation of the homoscedasticity assumption. As suggested by Das & Das, (2019) Panel Least Square Dummy Variable (LSDV) regression technique was employed to control for unobserved heterogeneity in the fixed effect model hence served as the basis for testing the hypothesis of this study

Table 4.3 **Financial Performance Regression Result**

	POOL LEAST SQUARE	FIXED EFFECT	RANDOM EFFECT	LEAST SQUARE DUMMY VARIABLE
_CONS.	1.553 ***(0.000)	0.938 **(0.010)	1.554 ***(0.000)	1.601 ***(0.000)
LTDEBT	-0.014 **(0.001)	-0.002 (0.600)	-0.014 ***(0.000)	-0.015 **(0.001)

STDEBT	-0.013 **(0.004)	-0.002 (0.816)	-0.013 **(0.002)	-0.013 **(0.007)
INTCOV	0.004 **(0.044)	0.002 (0.339)	0.004 **(0.036)	0.006 **(0.013)
F-STAT/WALD STAT	7.78 (0.0005)	3.36 ***(0.0000)	23.35 ***(0.0000)	3.43 ***(0.0000)
R- SQUARED	0.4296	0.0370	0.0278	0.6515
MEAN VIF = 1.22				
Test for Fixed Effects Error	Hausman Specification Test			
F = 4.28	Chi^2 = 9.75			
Prob > F = 0.0132	Prob Chi^2 = (0.0208)			
Test for Random Effects Error	**Test for Groupwise Heteroscedasticity**			
$chibar^2$(01) = 0.00	chi^2(4) = 100251.14			
Prob > $chibar^2$ = 1.0000	Prob > chi^2 = 0.0000			
NOTE: (1) BRACKET () ARE P-VALUES; (2) **, *, IMPLIES STATISTICAL SIGNIFICANCE AT 5% AND 1% LEVELS RESPECTIVELY**				

Source: Authors' Computation (2025)

The negative effect of long-term debt ratio (LTDEBT), with a coefficient value of -0.0148862 and statistically significant at 1% level, on Tobin Q ratio (QRATIO) aligns with the agency theory of debt, which highlights the potential conflicts of interest between shareholders and managers regarding debt financing. According to this theory, excessive reliance on debt, particularly long-term debt, may exacerbate agency problems as managers may engage in risk-averse or suboptimal investment strategies to avoid financial distress associated with high levels of debt. In relation to listed agricultural firms in Nigeria over the review period of interest, a 1% increase in long-term debt ratio will lead to a significant decrease in Tobin Q ratio by about 1.49units, holding other factors constant. This decline in the firm's market performance reflects potential inefficiencies in the excessive use of long-term debt, which could impose additional financial obligations (Jensen & Meckling 1976).

Further, the negative effect of short-term debt ratio (STDEBT), with a coefficient value of -0.0126772, also statistically significant at 1% level, further underscores the risks associated with high debt levels. In line with the agency theory of debt, short-term debt creates more immediate repayment pressures, limiting managerial discretion and increasing the risk of liquidity issues, which negatively impacts firm performance. Relating with the outcome of this study, a 1% increase in short-term debt is associated with a 1.27units reduction in Tobin Q ratio. This suggests that agricultural firms in Nigeria, which typically operate in environments with volatile cash flows, face challenges in managing short-term debt efficiently, thereby undermining its market value. Lee and Dalbor, (2013) and Echekoba, & Ananwude, (2016) documented similar result highlighting the adverse effects of short-term debt on firm performance, particularly in emerging markets with limited access to low-cost financing.

Conversely, the positive effect of interest coverage ratio (INTCOV), with a coefficient value of 0.005662, statistically significant at 5% level, reveals that firms with higher interest coverage, (stronger earnings relative to interest expenses), experience improved market performance. As interest coverage increases by 1%, a 0.57units increase in Tobin Q performance is guaranteed. This outcome aligns with the Agency Theory of Debt, which argues that higher interest coverage reflects more efficient use of debt and lower agency costs, as firms are better able to meet their debt obligations without sacrificing investment opportunities. For listed agricultural firms in Nigeria, this outcome suggests that firm managers have been effective in debt management practices by utilizing interest coverage mechanism. Notably, pursuit of value-maximizing strategies reduces the likelihood of financial distress (Fitzpatrick & Ogden, 2011) consistent with earlier outcome of Enekwe, Agu, and Eziedo, (2014) underscoring the importance of maintaining strong interest coverage ratios in capital-intensive industries like listed agricultural firms in Nigeria.

5.0 CONCLUSION

The findings of this study reveals the impact of capital structure on financial value emphasizes the critical role of debt management in shaping firm value in Nigeria's agricultural sector, particularly within the theoretical framework of the agency theory of debt. While both long-term and short-term debt ratios exert negative pressure on Tobin Q ratio, indicating that excessive reliance on debt financing can be detrimental to firm value, maintaining a strong interest coverage ratio proves essential for enhancing market performance. These findings provide valuable insights for managers and policymakers aiming to optimize capital structure decisions to foster sustainable growth and competitiveness in the agricultural industry.

Recommendation

On the basis of the outcome, it is recommended that firm managers emphasize improving its interest coverage ratios while minimizing reliance on short-term debt to reduce liquidity risks. This can be achieved through enhanced financial management practices, such as adopting robust cash flow forecasting models and leveraging government or industry-backed financial support programs designed to mitigate the sector's inherent risks. Additionally, policies encouraging agricultural firms to access long-term, low-cost capital can be instrumental in fostering sustained growth and competitiveness. Not without future thrust, scholars may look forward to considering sector-specific factors, such as commodity price volatility and climate risks, which might influence firms' financing decisions and overall performance.

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APPENDIX

DATA ANALYSIS SOFTWARE OUPUT

```
/__   /   ____/   /   ____/      17.0
___/   /   /___/   /   /___/      MP—Parallel Edition

 Statistics and Data Science       Copyright 1985-2021 StataCorp LLC
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Notes:
      1. Unicode is supported; see help unicode_advice.
      2. More than 2 billion observations are allowed; see help obs_advice.
      3. Maximum number of variables is set to 5,000; see help set_maxvar.

. summarize QRATIO LTDEBT STDEBT INTCOV

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
      QRATIO |         40     1.10325    1.878623        .09      12.06
      LTDEBT |         40    24.20525    24.34072          0      92.87
      STDEBT |         40    32.90225    22.41126       6.46       76.5
      INTCOV |         35    14.35533    46.61815   .7640074   243.1708

. swilk QRATIO LTDEBT STDEBT INTCOV

                   Shapiro–Wilk W test for normal data

    Variable |        Obs       W           V         z       Prob>z
-------------+------------------------------------------------------
      QRATIO |         40    0.41513     23.119     6.609    0.00000
      LTDEBT |         40    0.81503      7.311     4.187    0.00001
      STDEBT |         40    0.88282      4.632     3.226    0.00063
      INTCOV |         35    0.30422     24.834     6.705    0.00000

. spearman QRATIO LTDEBT STDEBT INTCOV
(obs=35)

             |   QRATIO   LTDEBT   STDEBT   INTCOV
-------------+------------------------------------
      QRATIO |   1.0000
      LTDEBT |  -0.2173   1.0000
      STDEBT |  -0.2960  -0.5154   1.0000
      INTCOV |   0.4575   0.2259  -0.3773   1.0000

. reg QRATIO LTDEBT STDEBT INTCOV

      Source |       SS           df       MS      Number of obs   =        35
-------------+----------------------------------   F(3, 31)        =      7.78
       Model |  5.86705544         3  1.95568515   Prob > F        =    0.0005
    Residual |  7.78934397        31   .25126916   R-squared       =    0.4296
-------------+----------------------------------   Adj R-squared   =    0.3744
       Total |  13.6563994        34  .401658806   Root MSE        =    .50127

------------------------------------------------------------------------------
      QRATIO | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
      LTDEBT |  -.0135982   .0037438    -3.63   0.001    -.0212337   -.0059627
      STDEBT |  -.0134421   .0042739    -3.15   0.004    -.0221588   -.0047254
      INTCOV |   .0039663   .0018876     2.10   0.044     .0001165    .0078161
       _cons |    1.55376   .2229024     6.97   0.000     1.099148    2.008373
------------------------------------------------------------------------------

. vif
```

```
     sigma_e |  .43671879
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        QRATIO[croid,t] = Xb + u[croid] + e[croid,t]

        Estimated results:
                         |       Var     SD = sqrt(Var)
                ---------+-----------------------------
                  QRATIO |   .4016588       .6337656
                       e |   .1907233       .4367188
                       u |          0              0

        Test: Var(u) = 0
                             chibar2(01) =     0.00
                          Prob > chibar2 =   1.0000

. estimate store re

. hausman fe re

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |       fe           re         Difference       Std. err.
-------------+----------------------------------------------------------------
      LTDEBT |   -.0024137    -.0135982        .0111845        .0025765
      STDEBT |   -.0019504    -.0134421        .0114917        .0071177
      INTCOV |    .0017266     .0039663       -.0022397               .
------------------------------------------------------------------------------
                          b = Consistent under H0 and Ha; obtained from xtreg.
           B = Inconsistent under Ha, efficient under H0; obtained from xtreg.

Test of H0: Difference in coefficients not systematic

    chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
            =  17.96
Prob > chi2 = 0.0004
(V_b-V_B is not positive definite)

. hausman fe re, sigmamore

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |       fe           re         Difference       Std. err.
-------------+----------------------------------------------------------------
      LTDEBT |   -.0024137    -.0135982        .0111845        .0036325
      STDEBT |   -.0019504    -.0134421        .0114917        .0085172
      INTCOV |    .0017266     .0039663       -.0022397        .0007689
------------------------------------------------------------------------------
                          b = Consistent under H0 and Ha; obtained from xtreg.
           B = Inconsistent under Ha, efficient under H0; obtained from xtreg.

Test of H0: Difference in coefficients not systematic

    chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
            =   9.75
Prob > chi2 = 0.0208

. reg QRATIO LTDEBT STDEBT INTCOV i.years

      Source |       SS           df       MS      Number of obs   =        35
-------------+----------------------------------   F(12, 22)       =      3.43
       Model |  8.89656543        12  .741380453   Prob > F        =    0.0060
    Residual |  4.75983398        22   .21635609   R-squared       =    0.6515
-------------+----------------------------------   Adj R-squared   =    0.4613
```

```
    Variable |       VIF       1/VIF  
-------------+----------------------
      STDEBT |      1.34    0.746811
      LTDEBT |      1.29    0.777883
      INTCOV |      1.05    0.954410
-------------+----------------------
    Mean VIF |      1.22

. xtreg QRATIO LTDEBT STDEBT INTCOV, fe

Fixed-effects (within) regression               Number of obs     =         35
Group variable: croid                           Number of groups  =          4

R-squared:                                      Obs per group:
     Within  = 0.0370                                         min =          8
     Between = 0.9860                                         avg =        8.8
     Overall = 0.3639                                         max =         10

                                                F(3,28)           =       0.36
corr(u_i, Xb) = 0.6629                          Prob > F          =     0.7835

------------------------------------------------------------------------------
      QRATIO | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
      LTDEBT |  -.0024137   .0045447    -0.53   0.600    -.0117231    .0068956
      STDEBT |  -.0019504   .0083023    -0.23   0.816    -.0189569     .015056
      INTCOV |   .0017266   .0017757     0.97   0.339    -.0019109     .005364
       _cons |   .9377529   .3394023     2.76   0.010     .2425189    1.632987
-------------+----------------------------------------------------------------
     sigma_u |  .48237938
     sigma_e |  .43671879
         rho |  .54955746   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(3, 28) = 4.28                       Prob > F = 0.0132

. estimate store fe

. xttest3

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (4)  =       100251.14
Prob > chi2 =          0.0000

. xtreg QRATIO LTDEBT STDEBT INTCOV, re

Random-effects GLS regression                   Number of obs     =         35
Group variable: croid                           Number of groups  =          4

R-squared:                                      Obs per group:
     Within  = 0.0278                                         min =          8
     Between = 0.9629                                         avg =        8.8
     Overall = 0.4296                                         max =         10

                                                Wald chi2(3)      =      23.35
corr(u_i, X) = 0 (assumed)                      Prob > chi2       =     0.0000

------------------------------------------------------------------------------
      QRATIO | Coefficient  Std. err.      z    P>|z|     [95% conf. interval]
-------------+----------------------------------------------------------------
      LTDEBT |  -.0135982   .0037438    -3.63   0.000    -.0209359   -.0062606
      STDEBT |  -.0134421   .0042739    -3.15   0.002    -.0218188   -.0050654
      INTCOV |   .0039663   .0018876     2.10   0.036     .0002667    .0076659
       _cons |    1.55376   .2229024     6.97   0.000      1.11688    1.990641
-------------+----------------------------------------------------------------
     sigma_u |          0
```

Total	13.6563994	34	.401658806	Root MSE	=	.46514

QRATIO	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
LTDEBT	-.0148862	.004024	-3.70	0.001	-.0232314	-.006541
STDEBT	-.0126772	.0042629	-2.97	0.007	-.021518	-.0038364
INTCOV	.005662	.0020856	2.71	0.013	.0013366	.0099874
years						
2015	.5884879	.3802131	1.55	0.136	-.2000257	1.377002
2016	-.3119367	.3572231	-0.87	0.392	-1.052772	.4288988
2017	-.151439	.3587696	-0.42	0.677	-.8954816	.5926036
2018	-.2607228	.3581844	-0.73	0.474	-1.003552	.4821062
2019	.1662831	.3673031	0.45	0.655	-.595457	.9280232
2020	.0843131	.3624614	0.23	0.818	-.6673858	.836012
2021	-.1524412	.4030327	-0.38	0.709	-.9882799	.6833974
2022	-.682238	.4089389	-1.67	0.109	-1.530325	.1658494
2023	.1120943	.4112282	0.27	0.788	-.7407407	.9649293
_cons	1.601289	.3146134	5.09	0.000	.9488207	2.253757

APPENDIX II

YEARS	COMPANIES	EXCHANGE SECTOR	PRIMARY BUSINESS	TOBIN_Q	LONG TERM DEBT TO ASSET	SHORT TERM DEBT TO ASSET	INTCOV
2014	Ftn Cocoa Processors	Agriculture	Cocoa	0.25	25.22	29.66	
2015	Ftn Cocoa Processors	Agriculture	Cocoa	0.24	17	45.79	
2016	Ftn Cocoa Processors	Agriculture	Cocoa	0.25	15	57.89	1.012679231
2017	Ftn Cocoa Processors	Agriculture	Cocoa	0.23	32.31	45.36	0.764007414
2018	Ftn Cocoa Processors	Agriculture	Cocoa	0.21	36.6	40.77	0.908358147
2019	Ftn Cocoa Processors	Agriculture	Cocoa	0.23	48.82	43.1	1.259124378
2020	Ftn Cocoa Processors	Agriculture	Cocoa	0.09	75.48	23.77	1.728885561
2021	Ftn Cocoa Processors	Agriculture	Cocoa	0.09	92.11	24.34	2.927021972
2022	Ftn Cocoa Processors	Agriculture	Cocoa	0.31	0	18.71	1.87061191
2023	Ftn Cocoa Processors	Agriculture	Cocoa	0.12	92.87	11.78	1.839723246
2014	Livestock Feeds	Agriculture	Livestock Feed	1.39	2.84	66.63	27.39051095
2015	Livestock Feeds	Agriculture	Livestock Feed	2.34	1.12	51.76	5.50667535
2016	Livestock Feeds	Agriculture	Livestock Feed	0.79	1.47	64.04	2.349189258
2017	Livestock Feeds	Agriculture	Livestock Feed	0.58	2.62	54.73	1.56250562
2018	Livestock Feeds	Agriculture	Livestock Feed	0.23	2	69.65	2.713831325
2019	Livestock Feeds	Agriculture	Livestock Feed	0.47	2.8	57.32	2.303135889
2020	Livestock Feeds	Agriculture	Livestock Feed	0.37	0	62.9	1.094802291
2021	Livestock Feeds	Agriculture	Livestock Feed	0.37	0	61.09	0.981972726
2022	Livestock Feeds	Agriculture	Livestock Feed	0.64	0	67.98	1.167542128
2023	Livestock Feeds	Agriculture	Livestock Feed	0.6	0.39	76.5	1.242096011

2014	Okomu Oil Palm	Agriculture	Oil Palm	1.31	11.32	6.46	2.16888158
2015	Okomu Oil Palm	Agriculture	Oil Palm	1.4	5.7	19.03	1.642447045
2016	Okomu Oil Palm	Agriculture	Oil Palm	0.73	16.6	7.01	2.575946688
2017	Okomu Oil Palm	Agriculture	Oil Palm	1.44	27.29	12.55	1.083567186
2018	Okomu Oil Palm	Agriculture	Oil Palm	1.56	18.19	12.4	1.331777225
2019	Okomu Oil Palm	Agriculture	Oil Palm	2.06	9.87	12.01	2.329009758
2020	Okomu Oil Palm	Agriculture	Oil Palm	1.89	12.97	12.81	4.859648089
2021	Okomu Oil Palm	Agriculture	Oil Palm	1.22	24.97	8.1	
2022	Okomu Oil Palm	Agriculture	Oil Palm	1.58	25.32	11.46	243.1707909
2023	Okomu Oil Palm	Agriculture	Oil Palm	2.06	34.78	13.45	144.4866736
2014	Presco	Agriculture	Oil Palm	0.61	29.03	9.96	6.101357989
2015	Presco	Agriculture	Oil Palm	1.22	33.32	13.47	2.809195155
2016	Presco	Agriculture	Oil Palm	0.7	30.59	12.3	3.030192205
2017	Presco	Agriculture	Oil Palm	0.59	33.63	11.58	4.044289639
2018	Presco	Agriculture	Oil Palm	0.48	30.59	6.74	5.811122343
2019	Presco	Agriculture	Oil Palm	0.7	79.08	13.2	7.337939077
2020	Presco	Agriculture	Oil Palm	1.09	22.66	36.14	4.835572646
2021	Presco	Agriculture	Oil Palm	0.67	23.41	37.16	6.195365997
2022	Presco	Agriculture	Oil Palm	0.96	23.67	34.24	
2023	Presco	Agriculture	Oil Palm	12.06	26.57	52.25	